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ABSTRACT

Some basic principles underlying development and pedagogical application of computer courseware for English as a second language (ESL) are identified and two types of courseware developed at the University of Victoria (Canada) for use with pre-university, university, adult education, and elementary school ESL classes are described. It is proposed that materials for computer-assisted language instruction: (1) be designed to fit into the current curriculum, (2) have a component assisting the teacher in classroom presentation or demonstration, (3) have a component for individual or group work outside the classroom for extended tutorial interaction, (4) promote spoken interaction, and (5) include a component of speech output from the computer. These principles are discussed in the context of the materials developed at the University of Victoria, and it is suggested that teacher development of microcomputer materials be encouraged. In an appended section, the need for, and the design, development, programming, and evaluation of the two sets of materials are discussed. One set, consisting of three lessons for use with adult, university-level ESL students, provides extra practice in advanced essay writing in the form of tutorials designed for: (1) students, (2) contract and community education English language programs, and (3) visiting scholars requiring extra, guided English study. The other set of two programs was designed for elementary school students but could be used with adult beginning ESL students. (MSE)

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– TESL Occasional Papers, Vol. 8, 1984 –

*ESL Courseware — A Developmental Framework Including Discussions of University-Level and Elementary-Level Programs**

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INTRODUCTION

It has been remarked by others engaged in programming English as a Second Language (ESL) instructional materials for use on microcomputers that there is considerable room for expanding development of ESL courseware. Chapelle and Jamieson, of the University of Illinois, in a piece entitled 'Author! Author!' (1982:1), comment that

> *ESL teachers interested in using (micro)computers for instruction are finding that the number of commercially available ESL lessons has not kept pace with the number of computers in schools.*

At the same time, they note that the number of microcomputers available for instructional use in schools is soaring.

In this paper, we will identify some of the basic principles which underlie ESL courseware development and its pedagogical applications and describe two types of courseware developed at the University of Victoria for use with (1) university, pre-university, and adult education ESL classes and (2) elementary school ESL classes.

THE VALUE OF COURSEWARE FOR SECOND LANGUAGE INSTRUCTION

Among the most important principles that apply to second language courseware development are that materials for computer-assisted instruction (CAI) for second languages, often referred to as computer-assisted language learning (CALL):

(1) should be designed to fit into the current curriculum, following established principles of second language teaching and learning;
(2) should have a component which assists the teacher in the classroom presentation, or demonstration, or aspects of the content of the curriculum, for classroom interaction;
(3) should have a component which makes them useful for individual or group work to be performed outside of class, for extended tutorial interaction;

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* A demonstration of ESL programs developed through the cooperation of the Department of Linguistics, the Centre for Speech Technology Research, and Software Research Corporation at the University of Victoria, was given for the first time at the 16th Annual Convention of B.C. TEAL in March, 1983, in Vancouver.

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(4) should promote spoken interaction among students as a necessary component of second language learning — a first requisite for meaningful, successful second language acquisition;
(5) should include a component of speech output from the computer, in order to promote student interaction, to improve situational relevance, and to take advantage of the computer's vast potential for storing spoken as well as textual information.

It should be pointed out with respect to second language (SL) instructional materials developed in microcomputers, that this is not the first time that SL's have been presented using computerized techniques. Neither is it the first time that a new method of instruction has appeared whose potential is great but which SL teachers may feel reluctant to adopt unless its relevance and usefulness to teaching are clearly demonstrated. The 'PLATO' system at the University of Illinois has been in operation for a number of years, allowing many approaches to be tried and tested and guidelines to be established (see Cheng 1973); Jamieson and Chapelle 1981; Marty 1981). The potential of CAI is thus clear. On the other hand, audio-visual or "audio-lingual" materials, for example, and even language laboratory presentation of material, have often not been adopted because of a preponderance of equipment and a lack of conviction that the approach satisfied all, or at least the most critical, requirements for successful language teaching and learning.

The conclusions that may be drawn from these experiences are that CAI materials for ESL must follow the principles (outlined above) of relevance to the SL curriculum, easy integration into the classroom, pedagogical utility in the tutorial mode, spoken interaction, and the capability of integrating speech output into the program, in order to be practical, understood, and accepted. It may be, perhaps, that the greatest success in the use of microcomputerized SL materials will only come about when classroom teachers are able to program their own materials efficiently, according to their own personal approach and immediate practical specifications (see Chapelle and Jamieson 1982:1 and Nievergelt 1980). Nevertheless, microcomputer-assisted SL materials which follow the principles we propose have only recently been placed on the market and tested. As this courseware becomes available, and given the increasing availability of and familiarity with microcomputer hardware, there is no reason why SL courseware cannot become extremely popular and useful in the same way that well-written and soundly designed texts are an essential part of SL lesson preparation and presentation. Teachers are, after all, eager to locate and procure any new materials that satisfy the basic requirements of accepted second language teaching methodology, especially those which do so more efficiently than before.

PEDAGOGICAL GUIDELINES FOR SL MATERIALS

Of all the methodological principles relevant to SL teaching and learning, the five considered here are quite general, are based largely on functional pragma-

tism, and apply specifically to the use of microcomputerized ESL lessons in their present, early stage of development.

1. The CAI materials developed at the University of Victoria are designed to fit into the curriculum of two separate but specific groups of ESL learners — university students and elementary school students — although elements of each approach may be adapted quite successfully in designing sets of courseware for a variety of ESL requirements. To ensure that materials are practical, understandable and acceptable, we have insisted that experienced teachers work together with computer programmers as curriculum developers, designing and modifying how lessons will be integrated into the class syllabus. The two areas being developed here include lessons in essay writing skills, for university level ESL students at the present stage, and game format lessons combining demonstration and tutorial aspects, initially designed for elementary school ESL classes. The key point is that these are programs designed by teachers for use by teachers, in classrooms, with the tutorial aspect following from and supplementing in-class performance. This is consistent with Marty's finding based on the use of PLATO materials for teaching French:

> *Computerized materials can be successful only to the extent that they are based on a method of teaching which has proved successful in the classroom (1981: 43).*

2. Any materials which are offered for SL teachers to use must be capable of use in the classroom. This appears obvious, but the point must be made that no device, especially one involving complex hardware, can be made attractive to SL teachers unless they can take it into the classroom and build a significant portion of their day's lesson plan around it.

   An ESL lesson plan may be thought of as having five basic components — activities, function, content, situation, and contextual cues or prompts:

   (a) Activities form the day's lesson and may be designed to include speaking, pronunciation, listening comprehension, reading, vocabulary, writing. These constitute the basic schedule of events that the teacher will pursue during the time allowed.

   (b) Function refers to the importance and relevance of the presentation of language materials to the students' needs and life experiences; assuming that language will not be acquired except through meaningful use outside of class.

   (c) Content is the actual SL material that will be emphasized in communication activities during the class, or form the focus of structural presentations or exercises; reflecting the SL proficiency level of the students.

   (d) Situation is how the linguistic content is presented. The teacher may use stories, games, pictures, relevant and familiar topics, and the

various audio-visual aids that can be brought into use for the purposes of illustration and practice. Choice of situation is related to function and, pragmatically, to the availability and efficiency of the various possible aids.

(e) Contextual cues or prompts are the questions specifically prepared by the teacher to guide the class through the lesson. They span all activities, including transition times, rely on functional necessity to promote relevance to individual students, practice and reinforce the ESL content, and are based on the various situations chosen to present examples of the language in use. They are, in effect, a running script.

Computerized materials, then, should fit into each aspect of this lesson framework as follows:

(a) They must be expedient and easy to use; maximally adapted to a rigorous series of activities.

(b) An early requirement to meet is that they be functionally relevant. Often, if students are learning to use computers for other purposes, SL instruction can be nicely integrated to take advantage of the familiar format.

(c) Various forms of language content may be presented by computer, textually and audibly, and their form should be suitable to the "demonstration" format where the teacher illustrates new patterns with examples for groups within the class to work on together.

(d) Microcomputer materials, because of the possibility of random access to text, animated graphics and speech, provide attractive situations for presenting language content, as long as they serve as a supplement to the types of situations already used by the teacher during regular class sessions, or to present similar content to that usually presented by other means.

(e) There is certainly room for computerized materials to serve as the basis for descriptions, comment and questioning from the teacher — the contextualization necessary in a language class. These prompts or cues are not simply directions or instructions. They focus attention on the language itself and illustrate the functions, the uses, to which language is put. This implies that information does not necessarily have to be supplied by the program, although that is usually the case for other reasons. Instead, there is a great deal of room in a language class for the teacher to "talk around" the computerized lesson, using it as an object of class activity, including linguistic activity. In this way, CAI is used as a device to prompt interaction among students, instead of forcing students and teacher to use CAI programs in only a one-on-one computer/user format.

3. As well as functioning as a classroom aid, computer-assisted ESL lessons should be useful for individual work outside of class. In fact, their "tutorial" aspect is often the only one emphasized. In the theoretical

framework followed here, however, it is assumed that content will not usually be learned as the result of classroom presentation, but rather will be acquired as functionally significant classroom presentation is reinforced by similar occurrences in actual use in situations outside of class. Individual study is therefore no substitute for good classroom instruction, and tutorial exercises should not necessarily be designed in the same way as the classroom presentation. The key should be to employ related situations and contextual cues that present the content in a slightly different way in order to reinforce what is first seen in class.

It is important to stress here that computerized materials cannot, therefore replace the classroom, let alone the teacher.

> *It is essential to consider what kind of class the courseware will complement because ESL courseware is typically adjunct to classroom instruction. 'CAI does not seek to replace teachers; on the contrary, it endeavours to assist them with the instructional process' (Otto 1981: 58). (Chapelle and Jamieson 1982: 2)*

4. We believe that it is important to stress separately that the greatest success in second language acquisition using a computer-assisted presentation will come about as students interact with each other in response to the program, rather than as a result of interacting "with" the program. The program itself does not instruct in language use, but is instead a device to be manipulated by students as a tool to expose them to language use, while focusing on specific content areas of the curriculum. Experience in evaluating the usefulness of lessons developed thus far indicates that teachers are able to use these materials to stimulate the kind of classroom interaction usually desired, and that the "game" aspect of each program encourages interaction not only among students but between students and the teacher as part of a shared learning experience. Our precept is, then, that learning or acquisition occurs through this process of communicative interaction, instead of as the direct result of what the program is designed to "teach". Therefore, the ESL courseware which we design has a component intended for use by teachers in demonstrating to classroom groups. Manipulation by a single user alone, in the "tutorial" mode, is not sufficient for the successful implementation of these lessons in helping students learn English.

5. Finally, we have believed it necessary to insist that for CAI to be adopted in ESL, let alone to be effective pedagogically, it should include a randomly accessed speech output component. This follows from the natural importance which listening and listening comprehension have in SL acquisition, and which, having long been neglected, are becoming increasingly emphasized in ESL curriculum planning (see Morley 1972, 1982). This follows from a natural order of presentation which ESL teachers usually adopt and tend to complete as an integral four-part process in order to assure that initial exposure is sufficient and that

re-exposure will occur: "Hear it; say it; see it; write it." Each step in this process reinforces the preceding one; but one point remains paramount: There can never be too many models of spoken language communication for SL students to listen to, and often typical classroom exposure does not provide enough. Audio language laboratories are not always available or practical, so if the use of speech, randomly accessed through the computer, can be made feasible and widely accessible, then the four-step progression, beginning with hearing spoken language, can be repeated in varying contextualized situations in an interactive format not possible with tape recordings.

The possibility of achieving good quality, affordable, randomly accessed speech for microcomputer use appears to be very near. We should bear in mind, however, that the availability of speech output hardware may determine initially whether SL lessons will enjoy widespread use and success. We hope that the interactive format of existing lessons will help to bridge that gap. While a common view is that speech output capability will present new techniques in the use of CAI for SL learning, our view is the slightly more extreme one that unless speech output is included, a large part of the value of the system for SL instruction will be lost. Sherwood, working on a speech system for Esperanto, states that

> *Speech synthesis opens up new kinds of pedagogical techniques in computer-based teaching. To be fully satisfactory, the quality of the synthetic speech must be improved, which is likely to occur in the next few years. (1981: 181-182)*

This outlook is promising. Video disks offer another possibility of integrating speech with the microcomputer (see Wyatt 1983). At the same time, we should emphasize that speech output will simply bring computerized presentation in line with the pedagogical techniques already practiced and required in most ESL teaching. It is perhaps the single most valuable capability of the computer that we can exploit for language teaching.

Already it is possible to test the ways in which speech can be implemented in existing programs, and this is being done at the University of Victoria.

> *At the present time, the quality of commercially available speech synthesizers is lower than one would like for language instruction. However, rapid developments in electronics promise improved quality in the future. Some laboratory research synthesizers are already capable of producing high-quality, natural-sounding speech, which suggests that commercial applications may not be far off. It is interesting to test teaching techniques which, though presently handicapped by inadequate synthesizers, can give experience in the ways in which speech synthesis might be used in language instruction in the future (Sherwood 1981: 172).*

We would add that quite high quality speech modules are commercially available but their cost is still prohibitive for most educational applications. There are alternatives, however:

> *Of course one could also speak to the student by means of some kind of audio tape player controlled by the computer. The use of computer-controlled recordings has the advantage of permitting higher-quality speech than is presently available through speech synthesis (Sherwood 1981: 179).*

The programs currently being developed at the University of Victoria all make use of computer-controlled cassette tape-recordings, in an attempt to integrate this essential component of the language learning process into CAI for ESL.

CONCLUSION

In conclusion we might suggest that the ability of ESL teachers to author their own programs may provide the best examples of how microcomputers should be used, both within and outside of classrooms. Until that time, we continue to concentrate in our research on the link between the expert designer, planning lessons to fit into the curriculum, and the expert programmer, writing the programs that bring those lessons to teachers who would like to use and test them. The initial, pilot programs developed within this cooperative organizational concept are described in the Appendix.

APPENDIX

DISCUSSION OF UNIVERSITY-LEVEL PROGRAM

(a) *Need*

Three pilot programs, designed by Maggie Warbey and written by Ian McGarva, have been developed at the University of Victoria for use with adult, university-level ESL students. The three lessons are entitled:

1. Getting the Idea.
2. Subordination
3. Putting it Together.

The need which they fulfill is to provide extra practice in advanced-level essay writing in the form of tutorials for university ESL students, contract and community education English language programs, and visiting scholars who may require extra, guided study in English.

(b) *Design*

These programs are designed for advanced ESL students with a reading competency that approaches first year university. The specific needs of this group are increased facility with comprehension skills, both in listening and reading. They also need to practice writing in English, through guided reading and analysis activities. The form of the lessons is that of illustrated, augmented lectures.

Each of the three lessons highlights essay-writing skills: (1) outlining, (2) subordination, and (3) paragraph transition. They are interactive, 30- to 40-minute tutorials where the student makes elaborate choices, based on a model, finally producing an essay fulfilling specified criteria. The lessons focus on typical problems of ESL students, in order to enable them to work out English-acceptable solutions to composition sub-skills. They are constructed to be user-friendly guides, immediately applicable to classroom, including non-ESL, tasks. Again, they may be introduced in a classroom setting, and then pursued further independently. Listening comprehension is exercised by synchronizing the visual display with audio tapes as part of the choice and selection procedure. There is immediate correction of errors with indications of correct procedures, but as yet there is no scoring procedure or recording of amount of time spent on each lesson by the student. Such a program can be augmented very nicely by having students compose compositions collectively using a TEXT EDIT program. Together, these would provide an efficient alternative to oral and individual written composition following a model given by the teacher.

(c) *Development*

Explanations and examples in the visual text illustrate what is in the aural input. The examples and exercises in the text reinforce structural skills. Messages to the user give the correct answer after the second try; some are corrective and clarify the problem; some indicate no right or wrong answer but instead involve the student's own choice, at which point the program branches. Help is present within the program itself, as exercises and answers usually appear on the screen together with instructions indicating possible options. Students are intended to select choices offered by the program, and to do as little original typing as possible. In the demonstration mode, each selection procedure can be the source of individual concentration and competition to supply a useful sentence.

(d) *Programming*

The display includes text and graphics, with an aural text on cassette tape, cued by the program. Underlining enhances the visual text. Programming is carried out with the technical assistance of Software Research Corporation under the supervision of the Centre for Speech Technology Research of the University of Victoria.

(e) *Evaluation*

The quality and effectiveness of these essay organization programs are being evaluated in University of Victoria ESL classes to determine whether they work easily and accomplish their objective.

A User Guide accompanies the lessons and explains their use in detail.

DISCUSSION OF ELEMENTARY-LEVEL PROGRAMS

(a) *Need*

Two pilot programs, designed by Judy Scholefield and written by Eric

Paul and Arthur Sullivan, have been developed at the University of Victoria for use in elementary-school ESL classrooms:

1. The Baseball Game
2. The Grocery Store

Although designed initially for children, the pedagogical techniques employed, and their corresponding microcomputer implementation, could be used just as successfully in adult education classes for beginners in ESL. A demand for ESL programs of this sort has been created by the increasing availability of microcomputers in the public school system and the lack of suitable written texts for ESL in the elementary curriculum. The intention is to supplement that curriculum with text, graphics, and audio that provide sight and sound reinforcement for language patterns being experienced by newcomers to English-speaking Canada. The use of pictures in expanding vocabulary in a creative way will visually assist the students' comprehension, and allow appropriate individualization of tasks in the typical multi-level class situation.

(b) *Design*

The purpose is to provide visual (graphics), spoken, and written reference to new vocabulary. The material is designed to be demonstrated by the teacher in class and then used outside of class time. The level is for beginners who have already had some introduction to English in classes and who are naturally exposed to the language during the school day. The age group is elementary, ages 8 to 13, although the format is adaptable to a variety of ages and levels.

These lessons are designed in the game mode, involving listening comphension, visual recognition and identification, and multiple choice selection. The teaching objectives are basic vocabulary, recognition of spoken and written English, and recognition and identification of verbs and contrasting tenses. These objectives are met through the teacher introducing the class as a group to the use of the computer and its courseware, keying in responses and eliciting interaction from the class in a demonstration format. This can take 20 minutes or more, for the Grocery Store and also for the Baseball Game, depending on how frequently the teacher pauses to work on particular, related points. This is followed by a session where students try out the program on their own, with students taking turns playing the game in the tutorial mode. A much longer time may be spent here. As with other materials developed at the University of Victoria, tape-recorded descriptions and cues are synchronized with the visual display in the demonstration mode, and are controlled by the computer. Records are kept in the form of a running count and scores in the Baseball Game. Further developments, including estimated cost calculations or a "shopping spree", for example, are planned for the Grocery Store. Immediate feedback is provided on choices and actions to accompany aural and visual text, and on the structural relationships, for instance verb tenses, that are introduced. Errors are clarified by presenting the correct descrip-

tion and usage within a contextually clear situation.

(c) *Development*

A comprehensive User Guide accompanies and explains the use of each lesson, with details on the association made between aural signals and visual cues. Teacher demonstration is an important part of the explanation of examples — a process in which students are gaining practice in hearing and speaking English in an immediately understandable context. The Software Research Corporation team has provided considerable input to the type of exercises devised. They range from identifying items in a grocery store to making a shopping list and collecting appropriate items; and from identifying the parts of a baseball game to play a linguistic game based on the actions found in the sport, and keeping score.

Feedback messages range from "happy face" positive reinforcement to positive comments like "try again". A bleep and a picture of the "Cookie Monster" is the result of a wrong answer, where the food that was supposed to be selected in the grocery store does not drop into the basket, but since there is only a finite set of choices, eventually the correct response will be found. In most cases, the student is given three tries before being shown the correct answer. Help is provided in the form of cumulative assistance during each frame of the activity, with answers provided at each step, although at the present stage the lessons run straight through from start to finish without capability of jumping to different parts of the lesson. This reflects the program's developmental stage and, in addition to pedagogical preferability, is part of the reason why the teacher's introduction and explanation of the content of the lessons during a class session is so important.

(d) *Programming*

Cued spoken contextualization on cassette tape-recording is combined with text and graphic display. Exercises proceed linearly, therefore, through the lesson, with little or no branching. Text files have been created as much as possible, to record game scores or to keep track of items identified in a cumulative selection procedure.

(e) *Evaluation*

The quality and effectiveness of each lesson is being evaluated in an ESL classroom setting at Macaulay Elementary School (School Board of Greater Victoria, District No. 61). The degree to which these lessons function easily and clearly in accomplishing their objective will decide the directions which ESL courseware programming will take in Phase II of the current project, to be undertaken by Software Research Corporation and the Centre for Speech Technology Research of the University of Victoria.

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